Q Z X

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EDITOR'S NOTES

K5XY

QZX for last month was only six pages for three reasons listed in order of their importance.

Very few articles have been contributed.

My word processor was giving me fits.

The lower printing costs offset the increased postage.

The word processing difficulty is the most interesting, but I will not bore you with many of the details. Suffice it to say that, after it refused to save final files and would not open already saved files, it gave me messages saying "Fatal Error 600c" and "Error code 9". None of the help lines I consulted could tell me what the errors meant; not the application manufacturer, nor the seller of the front end, nor the maker of the operating system. At least with our computers we usually put in the errors ourselves, although QZX has documented a few errors in the ROM of the ZX81 and TS2068.

This issue is very late obviously. There are a lot of reasons, but the biggest is that I did not get around to it. There was enough time, but it was interrupted by a business trip to Orlando, Florida.

While there I did meet a physics teacher who specialized in designing experiments for his classes which used inexpensive equipment. He mentioned that he still used Sinclair computers for some of these experiments.

Another long time Sinclair newsletter has stopped publishing. The Hacker, published from Nevada by the Timex Sinclair User Group of Las Vegas, expanded its coverage to include all computers, not just Sinclair computers, and then finally ceased publishing entirely. They got to the point where the number of issues they were sending to other newsletters was about ten times the number that they were sending to the paying club members.

Some good news for QL users comes from the New England Sinclair QL Users Group. They say that there is great interest on the part of European software producers in taping the North American market. The bad news is that most of these publishers produce game programs.

The club however has recently obtained a lot of QL software and is issuing library disks. The first one has over 60 files on it, but none of them had a specific ham application. More disks are coming however.

The operative word in the above sentence is "disks". Most people who are actively using their QL's have installed a disk interface. The one of most interest is the Gold Card, which unfortunately, costs more than most people paid for the QL.

Expect the next issue in about three weeks if all goes well.

QL FIXES

Bob Curnutt

The article that starts on the next page was transcribed and edited a bit by WA6DLI. He got it from the CATS newsletter of May 1989. The Capital Area Timex Sinclair users Group has consistently published one of the best newsletters left.

The tendencies for the QL to lock up which is mentioned in the article have puzzled many people including the makers of the machine.

The technical manual for the QL admits that the factory did not know what caused the problem. Here is a reasoned solution, based on much investigation. Many people have had success by adding the capacitors suggested in the following article gives the details.

(Reprinted from CATS Newsletter May 1989)
[CATS = Capitol Area Timex Sinclair user group]

SOME NOTES ON THE QL FIXES by Bob Curnutt (with reviews and side comments by Tom Bent)
the first definitive article on the "Tom Bent" mods

We have all gotten QL computers at salvage prices, entirely due to the rush into production 5 years ago. The majority of users seem to be able to adapt to the "system lockup" syndrome, but it has alienated thousands.

As far as we know, we at the CATS user group are blessed with the only QL expert this side of the Atlantic, Tom Bent.

Tom has run to ground the major faults, all traceable to hasty design. The last '88 issue of Quantum Levels details the simplest "cure" for the voltage regulator overloading: the 20 ohm shunt. (The first issue of Quantum Levels suggested on doubling up on the original regulator.) BOTH are worthwhile starting fixes. I'd like to outline the others he has shared with out group at the "hardware sessions" which precede our regular monthly meetings.

** HELP IS AT HAND

By the time you get this, the latest "Quantum Levels" should be available, and should have drawings and much more detail; this is written for those who don't have any other source, and may be about ready to scrap their crashing QL.

The following assumes only that you have done some soldering on P.C. boards, and do NOT have a circuit diagram or "Service Manual". The QL board is not really as delicate as you might assume; it is similar in quality to the ZX-81 and 2068. The following descriptions refer to the labels on the board, near each component, small but visible. All directions are referenced from the user's normal view, as though you had a transparent keyboard. I hope you can do the following, and still have your machine work a little; then you can send it to Tom Bent and he MAY be able to do the final testing (outlined below) and return it with minimum effort. **(transcriber's note: I doubt that Tom is interested as 1992 is here! WA6DLI).**

First the "cold" fixes, preferably on a machine which still runs up to the "F1/F2 Menu". Remove the top cover, saving screws in a safe place (label the two nearest the right bottom foot MDV1 and MDV2 and leave them in place).

For this article, the "motherboard" need never be taken out of the case. If the power connector needs re-soldering, or the extra wire is added to supplement the sometimes anemic 5 volt power traces, then the board has to come out. I avoid doing this only because of the difficulty of inserting the microdrive ribbon cables where you really need good, thin, needle-nose pliers.

Use fat-nose pliers on the upper "ear" of the power receptacle while plugging in the connector. (I've had to replace mine, since they eventually break off when bent back and forth too many

times. The pins come out though the rear, incidentally, and are not all that hard to replace. I use standard "header" pins, 25 mils square, 5/8th -inch long; sure, the originals are 25x40, but use gold plated!)

After powering up, check the DC voltage with a calibrated meter at the leftmost pin of the regulator; 5 to 5.2 volts is nice. A quick check at the jumper wire to the 68008 may show 1/10th volt less. This may be due to RF on the line. Less that 4.9 volts may mean a defective regulator. Make sure there is a 0.1 mfd capacitor attached between the center pin and the right hand pin; the factory provided a 0.47 mfd electrolytic way down on the board, but it's several inches away. A really high gain regulator may oscillate with this much inductance in its input, which could cause it to shut down. (Your ZX-81/1000 could use the same treatment).

** SUPPORT YOUR SAGGING 68008'S POWER

The insulated jumper between IC-18 (the 68008) and the foil near C5 (between J1 and J2) is at the END of the 5 volt trace, a foot away from the regulator. The "223" ceramic capacitor added between pin 13 (+5v) and pin 35 (gnd) needs help. A 10 microfarad 10 (or more) volt tantalum type capacitor should be added in parallel; note that the plus(+) side should go to pin 13. Use a cap with less that 1/4-inch diameter or the keyboard may press on it.

The straggly jumper can be replaced with solid #20 wire with a ferrite bead or two slipped on for further isolation from noise. All holes in the board are big enough for #20 wire (0.032" dia.), but with solder in them they sometimes seem closed up, even when hot, so you might want to use #22 wire.

Note at the lower end of J1, pins 1-A/B are connected to a wide trace that should stop beyond DC-17; the later boards were made with a gap; if connected cut yours here. (See later re:8049). This is part of the ground which promoted a bad "ground loop" condition, the MAIN problem with the QL.

Re-solder the two upper solid wires (#30) from the 'spider board' where they're often poorly soldered to the board. If the 'spider board' feels the least bit warm in use, connect pins 1, 3, and 5 to pin 14. This will tie the three unused gates "high" as is proper TTL practice. (This is a hex inverter, half unused, CMOS at that!) Also connect a 0.001 mfd cap between pin 7 (gnd) and pin 14, to short noise to ground. CMOS chips are supposed to run cool.

While you're near the 8301 (IC-22), solder another 0.01 mfd (or "103" ceramic) capacitor between pin 15 (+5v) and pin 6 (the only ground for the whole chip). This is on the common side with the 68008. Next, connect a 0.001 mfd cap between the same pin 6 and the wire across the 68008, which connects it's pin 15 (gnd) to pin 35 (ground on the side next to the 8301). This provides more shunting of 'differential' noise between ground levels to them.

The 8049 is the 40 pin chip located at the lower right hand corner of the board, near MDV1_. It is the Intelligent Peripheral

Controller, and needs two capacitors, like the 68008. A 10 mfd, 10 V.(or more) tantalum needs to be connected between pins 20 and 40 which are diagonally opposite; connect the + lead to pin 40, (closest to the 5 volt regulator); also connect a 0.1 mfd ceramic across this, fully bypassing this trouble spot. At this point, note if the trace between 11 pin ribbon connector and pin 1 of the 8049 has been "factory" cut; most have, and it should be done. (I'm typing on #1310, which has none of the 'bandaids' yet has never locked up. It now has all the "fixes" described here and MAYBE never will.) I believe the intermittency problem is due to small individual faults spread about though the board's population; find and replace the faults and you will get a well behaved QL.

** NOW FOR THE HARD PART

(Transcribers note: All the discussion about deciding on the proper value by measurement is made moot by Tom Bent's insert to just use 220-270 picofarad for all machines!)

There's one important above board fix left; it is one of the easiest to do, but most difficult to determine EXACTLY what to do. The big hitch is that inspection of the data lines from the 8301 (DB30 to DB7) requires a 300 MHz bandwidth oscilloscope as the rise and fall times are near one nanosecond. These data lines mainly carry video signals, so some experience with setting the trigger levels is needed. You're looking for a 3 to 4 volt negative slope signal with a nanosecond fall time. The problem arises at the bottom end, where a volt or so of 'overshoot' is DESIRABLE; 1.5 v. or more could mean trouble, 2 or 3 volts means the 8301 should be destroyed already! The excess overshoot is due to the sloppy ground returns, with the traces feeding the RAM chips at the far right from the 8301 (IC-8, IC-14, and IC-15), putting most of the noise on the rest of the "bus".

Tom Bent's fix is very simple; attach PROPER sized capacitors between each affected RAM chip's pin 14 and pin 8 (+5v.). This slows down the falling signal without overly slowing the original rise to +5 volts. Too large a capacity doesn't crash the machine immediately, but the fall time can become so long as to make the "fall" a long ramp; don't remove all overshoot! It's a sign the system is running at maximum speed.

A few specifics: DB0 is associated with 8301 pin 14, DB1 with pin 16, DB2 with pin 19, DB3 with pin 21, DB4 with pin 23; these have fairly well matched lines to ground and are the ones to compare to lines 5, 6, 7. DB5 is on pin 25, DB6 is on pin 26, DB7 is on pin 29. DB6 has the worst matched line and can be 2 volts when the first three are 0.7 volts. It takes some experience to determine how much capacitance to add, typically 50 to 390 picofarads in proportion to excess overshoot. **(I recommend 220 to 270 for all machines-TB).** Where to put them? To correct DB4, IC-13 (pins 8 to 14); Put little caps on pins 8 to 14 as follows: IC-13 for DB5, IC-15 for DB6, IC-8 or IC-16 for DB7.

(Transcriber's Note: The rest of the article is omitted, as it deals with borrowing the high tech scopes etc. and how to use them. This article is reprinted mainly as a convenient source for easily made fixes by adding the caps and other components. At the end Tom used a single size for all the fixes that were previously tailored by measurement..BobH WA6DLI)

UNCLASSIFIED ADS

WANTED: UNCLASSIFIED ADS for publication in QZX. Cost is 1 cent for each keystroke (characters, blanks, etc.). Payment must be included with order. This is an excellent way to sell your program or unwanted equipment, ask for help, or find a specific program. Send your ad with payment to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

FREE: One Byte-Back M 16 16 K RAM (no printed circuit board on the feed through socket). Contributed by KA8THG. As is. It would be appreciated if a contribution toward the mailing expenses were made. Send requests to QZX, 2025 O'Donnell, Las Cruces, NM 88001.

FOR SALE: Timex 1000 with power supply, instruction book, and 16 K RAM. As is. $9 (plus $2 for shipping). Alex. F. Burr, 2025 O'Donnell, Las Cruces, NM 88001.

QZX Discount: 15 % discount on all orders mentioning QZX. T & C Services (address in ad in this issue).

NET DIRECTORY REVIEW

K5XY

Here is a short review of a book which lists over 900 special interest nets from all parts of the world. I was particularly interested in it because it makes an effort to include special interest groups.

The author, Mike Wilkowski, edits the ham band section of the monthly bulletin of the Association of DX Reporters and publishes his own monthly ham DX newsletter. As might be expected, this book lists quite a few DX related nets and a lot of nets from other countries.

I was a bit disappointed in not being able to find listed any nets with an indicated interest in Sinclair computers, let alone computers in general. I also noticed that there was listed a county hunting net on 10 meters, but that the most important county hunting net (on 20 meters) was not listed at all. These observations are not particularly surprising because it would be impossible for one person to keep track of all the nets in the world.

The book is the printed output of a data base which has fields for the net name, frequency, time, and day of operation. The book is divided into three sections, listing the net by name, by frequency, and by starting time.

The book itself has 57 numbered pages, is spiral bound, and has sturdy green covers. The size is 8 1/2 x 11 inches. Now in the third edition, the book is available for $9.95 (plus $2.00 shipping) from Tiare Publications, Box 493, Lake Geneva, WI 53147.

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TNC TIME SET

K5XY

Here is a short BASIC program which is designed to automatically set the Day variable on the usual TNC. It will have to be modified a bit depending on whether your computer is a ZX81, TS2068, QL, or Z88. The Day variable in the usual TNC is the memory location which is used to time stamp the heard reports and received packet messages. It contains the year, month, day, and time. The QL and Z88 will provide this data automatically. The ZX81 has to have a custom program to keep track of the time active. If the QL has the Gold Card addition it will even keep the time automatically even if turned off.

Here is the program.

```
1   REM *** The following program
2   REM will send the  time to your tnc
10  REM ** set tnc clock by W2IHJ ***
140 OPEN "com2:1200,E,7" as #1
150 REM Routine to get computer
151 REM time/date and convert to
152 REM TNC format
160 TNCDATE$= RIGHT$(DATE$,2) + LEFT(DATE$,2) + MID$(DATE$,4,2)
170 TNCTIME$ = LEFT$(TIME$,2) + MID$(TIME$,4,2)
180 TNCUPD$ = TNCDATE$ = TNCTIME$
190 PRINT "DAY " + TNCUPD$
200 PRINT #1, "DAY " + TNCUPD
210 SYSTEM
```

Here are some comments on the various lines which will help you adapt the program to your computer.

Line 140 opens a channel to the serial port which is connected to your TNC. In the QL this would be one of the serial ports, probably SER1 in the typical set up. This line also sets the data rate that you use with your TNC.

Lines 160 to 180 uses string slicing techniques to take the information from the computer (in this case assumed to be contained in string variables named date$ and time$) and puts it in a form which can be more easily transmitted to the TNC.

Line 190 prints what is to be sent to the TNC so you can verify that all is well.

Line 200 does the actual sending. Here day is the command which tells the TNC to update its time stamping variable and the TNCUPD$ contains the numbers to be used to perform the update.

Line 210 returns program control to the operating system. The port can be left open because presumably you are now going to use your TNC.

73, K5XY

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